

Welcome to Beyond Trigger Point Seminars, Neck & Head Unit Module 4. This lecture will focus on the masseter muscle and the medial and lateral pterygoids. The TMJ is one of the few joints in our body requiring bilateral action. The left side has to move with the right. So this joint in particular requires a bilateral muscular balance in order to function quietly and smoothly. It's estimated that the TMJ moves at least 10,000 times a day. Every time you swallow, talk, chew, clench or kiss, this joint and the muscles of mastication are active. As I hope you understand by now, trigger points increase muscular tension and often produce predictable pain patterns. A nickname for this muscle is *Locked Jaw* because the masseter is the most likely muscle we have studied to cause the most amount of jaw restriction.

Let's begin by looking at the anatomy of the masseter. On page 33 of the study guide, we will describe the two actions of the masseter.

1. Elevate the mandible, which closes the jaw.
2. The deep fibers of the masseter retrace the jaw, which pulls the lower teeth back.

There are seven documented trigger points as shown in our red bibles, *Myofascial Pain & Dysfunction the Trigger Point Manual*, Volume 1. On the body scan labeled "A" on the study guide, draw two "X's" just above the upper teeth near the musculotendinous junction of the superficial masseter muscle. The documented referred pain pattern for these two trigger points is into the back three molars. So draw a solid colored pain pattern to the back three molars just as you see it on page 34 of the study guide. There is also a primary pain complaint into the cheek. Clients often use the word sinusitis to describe that pain pattern while taking their hand and rubbing beneath their zygomatic arch.

Figure "B" on page 34 shows the two documented masseter trigger points below the lower teeth. The pain pattern for these two trigger points are into the lower jaw and lower molar teeth. Clients will take their hand and point to the area just above their jaw line, below their molars and just in front of the masseter.

On Figure "C", there's two documented trigger points there as well.

Those are also attachment trigger points in the lowest portion of the superficial layer. On body scan “C” draw those two “X's” at the distal attachment of the muscle. They're in a horizontal line with each other. In my experience, these two trigger points are often encountered within very taut bands characteristic of trigger points. The pain pattern is also over the lower jaw area and over the eye brow. That's a headache pattern for some people. They'll take their finger and trace over their eye brow when they describe this pain.

Figure “D” shows the deep layer of the masseter with the superior fibers cut away. There's one documented trigger point within its superior attachment. Draw your “X” just underneath the zygomatic arch and close to the ear. The primary pain pattern is in front of and into the ear and over the TMJ. This deep masseter trigger point can cause tinnitus. The tinnitus or the ringing in the ears may just be on one side. Stretching the jaw can either activate or interrupt it. So when yawning, the client may be able to stop or start the ringing. I have begun treating a professional vocalist recently who described the tinnitus in her right ear as a low rumbling like sound of a freight train. She also has an associated awareness of pain deep into her ear and over the TMJ. The pain pattern into any of the teeth you just drew might also be described not as pain but as hypersensitivity. In the same way that the temporalis creates a sensation of weakness in the teeth when a person bites down on something; the masseter causes a similar sensation of sensitivity to stimulation such as occlusal pressure and hot and cold stimuli. The client might feel it's related to their gums, but in fact it may be a myofascial pain syndrome due to trigger points.

Let's move on to the page 35 of our study guide to “Name four differential diagnoses your client might present with when masseter trigger points are involved.” We are not trying to be doctors. We're just trying to figure out what our clients are telling us. The diagnosis gives us useful information on which muscles we might explore when we put them down on our table. The first differential diagnosis is as we mentioned:

1. Tinnitus and/or an ear ache of unexplained origin
2. TMJD or TMJ Symptoms or TMJ Pain Dysfunction- you

may hear any of those used by physicians. Clients will often say they have a TMJ, but can't remember what their doctor had diagnosed. What a TMJD or a TMJ Pain Dysfunction has in common is poor coordination of the TMJ because of increased spasm and imbalance in any of the masticatory muscles. Trigger points may or may not create problems or misalignment of the joint itself. Keep in mind when a person presents with TMJD, chances are they do have trigger points but the trigger points in and of themselves may not cause any misalignment of the disks or joints.

3. Bad tooth-just write that down because you might hear it. The client may truly believe the tooth is bad though a dentist will find nothing wrong. If the patient convinces the dentist to perform a procedure anyway, I quote the book here, "A disastrous result can occur for an innocent tooth."

4. Migraine or tension type headaches- in multiple studies, these types of headaches have a high probability of originating from myofascial trigger points. I hope by this fourth module of the Neck & Head Unit, you are impressed with the good you can do by deactivating trigger points. The masseter very commonly harbors trigger point. Therefore it's an important muscle to palpate and treat.

Let's move on to activation and perpetuation. Under postural and activity stress there's multiple factors. I think you'll have fun thinking about your clients, their occupation and relating it to the masseter.

1. Forward head position. Once again is an activation and perpetuation for the masseter muscle.
2. Another is chronic mouth breathing.
3. Forceful contraction of the jaw, such as when grinding the teeth or bruxing and clenching. For example, here in Southwest Florida, scuba divers activate their masseter from clamping their lips around the breathing apparatus.
4. Occlusal disharmony. One side could just be worn down

more than the other or dental work could have caused the teeth to not meet evenly. Or maybe a posterior tooth has been lost or pulled. Any of these examples can cause all sorts of imbalances in the bite.

5. Wearing surgical masks. Your health care providers who wear masks all day are more at risk to developing increased tension in their jaw.
6. Oral sex
7. Emotional stress is another activation and perpetuation. When we're anxious, we tend to clench our jaw, tighten our fists and elevate our shoulders. It's called the startle reflex. That's just how we're wired to respond. In one study, the masseter muscle was found to be among one of the first muscles to contract when a person is in a state of extreme emotional despair or intense determination. In another study of 42 patients with a myofascial pain dysfunction, the masseter was found to have the second highest prevalence of active trigger points. The upper trapezius had the highest incident.
8. Other stresses include whiplashes due to car accidents, falls, bar-room brawls or even roller coaster rides. I had a patient who was hit while her head was turned sideways talking to a passenger. That's probably why she was hit, you think? She remembered having her head rotated and her mouth opened when she was struck and instantly feeling she had injured her neck and jaw.
9. Immobilization of the jaw would be another stress like my gal who had her jaw wired shut after her bicycle accident.
10. Chronic infection and inflammation, such as sinusitis or gum disease, might be another factor.
11. Finally, the masseter muscle is prone to develop satellite trigger points because it lies within the pain pattern of the SCM and upper trapezius.

Because many of the factors I just named can affect other muscles as

well, how do you really know if the masseter is involved? On the next page of your study guide, “Two findings or tests indicative of masseter activity” will help guide your decision.

1. A loose two knuckle test. To perform this on yourself, make a fist with your non-dominant hand. I'm right handed so I'm going to make a loose fist with my left hand and then insert the knuckles of the index and middle fingers into my mouth between my upper and lower teeth; just like I'm feeding myself a knuckle sandwich. Without forcing your mouth open, can you readily do this without pain? If you answered yes, then chances are your masseter has full range of motion. Pain-free range of motion is between 36-44 mm. If the opening is less than two knuckles, than this is a red flag for masseter involvement. When I was in training, we learned to insert three knuckles. Three knuckles generally equal about 40mm which falls within a normal opening for the jaw. However, because it is not a good idea to ask a person who might have TMJ dysfunction to forcefully open their jaw, it's better to assess with a loose two knuckle test. If they can perform a three knuckle test without forcing, it's unlikely they have masseter or temporalis trigger points. In fact that might be indicative of a hypermobile joint.

When answering the question and the fill in is: The *masseter* muscle restricts jaw opening the most. Interestingly, the client may not be aware of the range of motion lose because they can open their jaw wide enough, about 30mm, to bite into a sandwich comfortably. Still, the masseter causes the most jaw restriction. Conversely, and the next fill-in is: The *temporalis* causes the least restriction.

2. When you see an excessive forward- head posture with rounded shoulders then you can assume increased stress has been placed on the masseter muscles. Why? Because the suprahyoid and infrahyoid muscles are being over stretched causing increased elastic tension on the jaw, hyoid bone and tongue. Automatically then, the masseter reflexively contracts to close the mouth.

Let's move on to list the corrective actions. Aren't you glad I typed all those corrective actions on page 36 of the study guide? We're going to run through them now. Restoring normal head position is an important beginning in correcting almost any neck and head pain condition. We talk about this even more in our workshop. The second is to place the tongue on the roof of the mouth as if you're pronouncing the "n" sound in "nighttime" and then breathe through the nose. Do you feel how this relaxes the jaw?

Another is to make an appropriate referral for resolution of cervical spine dysfunction. It's difficult to align the jaw if down below there is misalignment. Stop chewing gum or chewing on ice. Wearing a splint at night if they grind their teeth while sleeping will also reduce stress on the muscles of mastication. Have infections resolved. Check the condition of your client's thyroid because in this country there are so many people with low thyroid functions.

Dr. Travell talked a lot about low thyroid function and in Chapter 4 of our text you can read more. She adamantly insisted that patients with chronic myofascial pain syndromes have their thyroid treated even when the test range was in the low normal quadrant. Any myofascial pain syndrome is also going to be affected by anemia, vitamin deficiencies and electrolyte imbalances and improved when corrected. Treating depression will also affect recovery. Another correction is addressing a lower limb length inequality.

Reducing emotional stress by coming in for a massage more frequently may also help! Train your client to ask for breaks during dental procedures. For our medical providers, remind them to take their surgical mask off and to stretch their jaw periodically. In our last module we learned the temporalis stretch; opening the mouth wide like a lion will also stretch the masseter. Finally it's also important to treat the other muscles of the neck that might be involved.

To effectively palpate nearly the entire midmuscle portion of the masseter, the therapist can use a pincer palpation between one gloved finger on the inside and the other on the outside. The digit strumming the muscle fibers inside the mouth will feel a taut band and trigger point more accurately because only a thin layer of mucosa separates

the inside finger from the muscle. On the outside the parotid gland lies under the skin of the cheek thus preventing an accurate or comfortable palpation. If you have difficulty localizing the masseter, ask your client to gently bite down on a cork. I have a half a dozen clients who regularly supply me with corks for both the workshops and my practice. With or without the cork, the pincer method is best performed by having the client hold their mouth open in a relaxed open position while you cross fiber friction the muscle.

Let's imagine now, you're asking yourself if you need to pull out a pair of examination gloves. How would you know, in a nut shell, if you needed to work interorally? On page 37 of the study guide, where it says, "Treat the muscles when," here are two things to consider:

1. Mandibular range of motion is and the fill-in is restricted. That's simple. If your client's two knuckle opening is restricted, they might benefit from having you work inside their mouth.
2. Mandibular movement from mid-line is deviated. The fill in is deviated. So when you are looking straight on at your client's face and you notice the jaw deviating to the left or right when the lower jaw moves, then treatment might be indicated.

Now we're going to differentiate when you wouldn't want to *stretch* the masseter muscle and secondly when you wouldn't *treat* any of the masticatory muscles.

1. Do not stretch when there is painful clicking. Painful is the operative word. Clicking and popping are usually painless. A lot of people will have these sounds. Many people have joint sounds without any joint dysfunction. Rough, sandy, diffuse sounds are signs of degenerative joint change and a lot of people have degenerative changes occurring in their joints.
2. The fill in is locking. So, frequent episodes of an inability to open the mouth is significant, particularly if they have to open the mouth by manipulating the jaw in some manner to get the disk to slide over and back into place. That's a problem a specialist needs to evaluate first.

Finally, do not treat when inflamed. The fill in is inflamed. For example, people who have gum or tooth infections need to be referred out to a specialist first.

People we can treat and who would really benefit from your care would be the folks who have a tender TMJ. What do I mean by a tender TMJ? Well, if you put your pencils down, we're going to do two simple tests indicative of a painful or tender TMJ. The first is palpation of the lateral pole. Take your index fingers and place them in front of the tragus of the ear over both TMJs. When you open and close your mouth, you should feel both TM joints moving. If you feel a bony protuberance sliding forward and back as you open and close the jaw, then you are palpating correctly. Firm palpation may be uncomfortable, but if one side is more painful than the other, then the joint capsule may be inflamed.

A test of the retrodiscal tissues of the TMJ is shown on the bottom right of page 37 of the study guide. To do this, place your little finger into your ear and press down on top of the joint. It's okay if it's a little bit uncomfortable, but the test is positive for TMJ inflammation if it is painful. When this is the case, often one side is more painful than the other. Remember, I said joint inflammation may or may not be indicative of trigger points in the masseter and if it is inflamed, refer to a specialist before treating.

In summary, on page 38 of the study guide, when palpating the TMJ, ask yourself the following:

- Is there any point tenderness of the joint?
- Are there any sounds when opening and closing?
- Is there pain during movement?
- Does the jaw open straight? If not, describe the movement pattern.

If you are a beginner at assessing the TMJ, it is important to just record the findings. I know when I first started assessing jaws; my mind would jump ahead to which muscles were involved and I would confuse myself. A better starting point for therapists is to begin by

writing down their findings. For example, did the mandible zig to the left first and then to the right on closing or opening, or was there a shift in one direction or another? Did you record how far the mouth opened in a two knuckle finger test? If you measured the opening with a ruler, did you record the findings? Remember, full range of motion is approximately 36-44mm. Develop the habit of writing your findings down in your client's chart; refer out when necessary and then your treatment results will tell you the rest of the story.

Now we are going to move on to the pterygoid muscles. On page 41, the two actions of the medial pterygoid are listed.

1. Unilaterally the medial pterygoid creates lateral deviation of the mandible to the opposite side; it moves the lower jaw to the opposite side.
2. Assists in closing the jaw. In the text book on page 367, or on page 40 of the study guide, picture "B" and "C" shows the medial pterygoid from a lateral and coronal view. On picture "C", the coronal view, you can see how the fibers of the medial pterygoid lay closer to midline than the two bellies of the lateral.

We think of the lateral pterygoid as being the primary muscle involved with TMJ pain because both heads of the lateral pterygoid have a unique relationship with the joint's articular disc.

- Based upon electromyographic studies reported in our textbook, during closure of the jaw, the action of the superior portion of the lateral pterygoid tractions the rate at which the condyle and disc translates back to a neutral, closed position.

The inferior portion works antagonistically with the superior head to open the jaw. Its other two actions are:

- Protrudes the mandible- which juts the lower teeth forward.

➤ Laterally deviates the mandible to the opposite side of one muscle acting by itself. This action is seen when one tighter pterygoid causes the zig zagging of the jaw we mentioned earlier.

Do you remember the lateral pole you were palpating? Between the lateral pole of the mandibular condyle and the glenoid fossa of the temporal bone, a tough fibrous disk is sandwiched. There is a picture of the normal temporomandibular joint function on page 42 of the study guide. Figure A shows the mandible in a closed position. The disc is the stippled structure and the superior and inferior portion of the lateral pterygoid are depicted by the horizontal stripes. Figures B-D shows the progressive stage of opening. As the mouth is opened, the disc slides forward with the condyle and then back again when the mouth is closed.

On page 39, the body scans are there for you to draw the pain patterns of the medial and lateral pterygoid. The one documented trigger point of the medial portion can cause stuffiness inside the ear and a pain over the TMJ and a diffuse sensation inside the mouth. The coronal view of the skull is provided for you to draw that sensation inside the mouth. The nickname for the medial pterygoid is, *Ache inside the Mouth*. The two documented trigger points of the lateral pterygoid also refer pain over the TM joint and into the maxillary sinus. Nickname this muscle, *TMJ Dysfunction*. The pterygoid lays deep to the masseter which makes it impossible to reach its belly externally. To palpate these trigger points, interoral work is required. Even when you are interoral, the examination is only to the attachment site. We will NOT be able to palpate the belly. Don't let anybody trick you and ask if you were on the belly of the pterygoids. No, no, no, you'll just be on the attachment site.

Let's move on and list the factors activating and perpetuating pterygoid involvement. It's fairly simple. For the most part, the same factors activating these muscles also activate the masseter. Forward head position for example, bruxing, emotional tension, arthritic changes. One factor, different than the temporalis muscle, is playing wind instruments. Wind instruments cause protrusion of the jaw. You

have to pull the lower teeth forward in order to play a wind instrument. That can cause increased strain to the pterygoid muscles.

The correctives are also similar to the masseter. Because of the difficulty in palpating this muscle as well as stretching it, if after a few treatments, the pterygoids aren't responding to your great manual therapy, I have found it useful at times to refer out to an appropriately skilled physician or dentist for trigger point injection.

This is the final module of the Neck & Head Unit. If you haven't already, be sure to complete the online quizzes so you receive your continuing education credits. Those of you interested in joining us for the three day Neck & Head hands-on workshop can check out the upcoming dates and locations at www.beyondtriggerpoints.com. Since you have completed this unit, I now consider you one of my Trigger Point Gang, so look for the special offers and discounts I'm extending to you on future online and live events. Thank you for listening. Stay in touch!